

TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. 371

112740-177

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR

09/806594

INTERNATIONAL APPLICATION NO.
PCT/DE99/03055INTERNATIONAL FILING DATE
23 September 1999PRIORITY DATE CLAIMED
30 September 1998

TITLE OF INVENTION

METHOD FOR CONNECTING EXCHANGES VIA A PACKET-ORIENTED COMMUNICATION NETWORK

APPLICANT(S) FOR DO/EO/US

Wolfgang Fraas et al.

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371 (c) (2))
 - a. ☒ is transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☐ has been transmitted by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ A translation of the International Application into English (35 U.S.C. 371 (c) (2)).
7. ☒ A copy of the International Search Report (PCT/ISA/210).
8. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c) (3))
 - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☒ have been transmitted by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☐ have not been made and will not be made.
9. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371 (c) (3)).
10. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371 (c) (4)).
11. ☒ A copy of the International Preliminary Examination Report (PCT/PEA/409).
12. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c) (5)).

Items 13 to 20 below concern document(s) or information included:

13. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
14. ☒ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
15. ☒ A **FIRST** preliminary amendment.
16. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
17. ☐ A substitute specification.
18. ☐ A change of power of attorney and/or address letter.
19. ☒ Certificate of Mailing by Express Mail
20. ☒ Other items or information:

Submission of Drawings - Figs 1-3 on three sheets

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21. The following fees are submitted:

BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)) :

- ☐ Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO \$1,000.00
- ☒ International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO \$860.00
- ☐ International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$710.00
- ☐ International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4) \$690.00
- ☐ International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4) \$100.00

ENTER APPROPRIATE BASIC FEE AMOUNT =

\$860.00

Surcharge of \$130.00 for furnishing the oath or declaration later than months from the earliest claimed priority date (37 CFR 1.492 (e)). ☐ 20 ☐ 30

\$0.00

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	
Total claims	6 - 20 =	0	x \$18.00	\$0.00
Independent claims	1 - 3 =	0	x \$80.00	\$0.00
Multiple Dependent Claims (check if applicable).			<input type="checkbox"/>	\$0.00

TOTAL OF ABOVE CALCULATIONS =

\$860.00

Reduction of 1/2 for filing by small entity, if applicable. Verified Small Entity Statement must also be filed (Note 37 CFR 1.9, 1.27, 1.28) (check if applicable). ☐

\$0.00

SUBTOTAL =

\$860.00

Processing fee of \$130.00 for furnishing the English translation later than months from the earliest claimed priority date (37 CFR 1.492 (f)). ☐ 20 ☐ 30 +

\$0.00

TOTAL NATIONAL FEE =

\$860.00

Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) (check if applicable). ☐

\$0.00

TOTAL FEES ENCLOSED =

\$860.00

Amount to be:	\$
refunded	
charged	\$

- ☒ A check in the amount of \$860.00 to cover the above fees is enclosed.
- ☐ Please charge my Deposit Account No. _____ in the amount of _____ to cover the above fees.
A duplicate copy of this sheet is enclosed.
- ☒ The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. 02-1818 A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

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SIGNATURE

William E. Vaughan

NAME

39,056

REGISTRATION NUMBER

March 30, 2001

DATE

BOX PCT

IN THE UNITED STATES ELECTED OFFICE
OF THE UNITED STATES PATENT AND TRADEMARK OFFICE
UNDER THE PATENT COOPERATION TREATY-CHAPTER II

PRELIMINARY AMENDMENT

APPLICANTS: Wolfgang Fraas et al. ATTORNEY DOCKET NO.: 112740-177
SERIAL NO.:

INTERNATIONAL APPLICATION NO: PCT/DE99/03055

10 INTERNATIONAL FILING DATE: 23 September 1999

INVENTION: METHOD FOR CONNECTING EXCHANGES VIA A
PACKET-ORIENTED COMMUNICATION NETWORK

Assistant Commissioner
15 Patent and Trademark Office
Washington, D.C. 20231

S I R:

Please amend the above-identified International Application before entry
20 into the National stage before the U.S. Patent and Trademark Office under 35
U.S.C. § 371 as follows:

In The Specification:

On page 1, cancel lines 1-4, and substitute therefor

--SPECIFICATION

25

TITLE**METHOD FOR CONNECTING EXCHANGES VIA A
PACKET-ORIENTED COMMUNICATION NETWORK****BACKGROUND OF THE INVENTION****Field of the Invention**

30

The present invention relates to a method for connecting exchanges via a
packet-oriented communication network which permits voice data to be
transmitted via a packet-oriented communication network without any loss of the
voice quality.

Description of the Prior Art--

- On page 1, line 19, cancel "are" and substitute therefor --is--.
- On page 1, line 24, cancel "by means of" and substitute therefor --via--.
- On page 1, line 25, cancel the "--" and substitute therefor a --,--.
- 5 On page 1, line 26, cancel "are" and substitute therefor --is--.
- On page 1, line 27, cancel "are" and substitute therefor --is--.
- On page 1, line 32, cancel the "--" and substitute therefor a --,--.
- On page 1, line 33, cancel the "--" and substitute therefor a --,--.
- On page 1, line 33, cancel the "are" and substitute therefor --is--.
- 10 On page 1, line 33, cancel "these" and substitute therefor --this--.
- On amended page 2, line 1, cancel "need" and substitute therefor --needs--.
- On amended page 2, line 6, cancel "said" and substitute therefor --wherein the--.
- 15 On amended page 2, line 7, cancel "being" and substitute therefor --is--.
- On amended page 2, line 7, insert a --,-- after "and".
- On amended page 2, line 7, insert a --,-- after "hence".
- On amended page 2, line 7, cancel "being".
- On amended page 2, line 20, insert --present-- before --invention--.
- 20 On amended page 2, line 20, cancel "below" and substitute therefor --, therefore,--.
- On amended page 2, cancel lines 25-26 and substitute the following therefore:

--SUMMARY OF THE INVENTION

- 25 Accordingly, the present invention is directed to a method for connecting exchanges via a packet-oriented communication network, wherein data transmission involves data packets subdivided into substructure elements, and the connecting exchanges are connected to the packet-oriented communication network via respective conversion device, the method including the steps of:
- 30 transmitting, via a transmitting one of the connecting exchanges, data to be transmitted as substructure elements to an associated transmitting conversion

device; inserting, via the transmitting conversion device, the substructure elements into data packets unchanged; extracting, via a receiving conversion device associated with a receiving one of the connecting exchanges, the substructure elements from the received data packets; and forwarding the
5 extracted substructure elements to the receiving one of the connecting exchanges unchanged.--

On amended page 2, line 29, insert --present-- before "invention".

On amended page 2, cancel lines 35-36.

On amended page 2a, line 1, cancel "One" and substitute therefor
10 --Another--.

On amended page 2a, line 1, cancel "of refinements".

On amended page 2a, line 1, insert --present-- before "invention".

On amended page 2a, lines 1-3, cancel "which are defined in the dependant claims is, amongst other things, and substitute therefor --, pursuant to
15 an alternative embodiment, is--.

On page 3, line 1, cancel "of refinements".

On page 3, line 1, insert --present-- before "invention".

On page 3, lines 1-2, cancel "which are defined in the dependent claims" and substitute therefor --, pursuant to yet another embodiment,--.

On page 3, cancel lines 10-12 and substitute the following therefor:
20

--Additional features and advantages of the present invention are described in, and will be apparent from, the following Detailed Description of the Preferred Embodiments and the Drawings.

DESCRIPTION OF THE DRAWINGS--

On page 3, line 22, insert --and-- after the ";;".
25

On page 3, before line 28, insert the following centered heading:

--DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS--

On page 3, line 30, cancel "by means of" and substitute therefor --via--.

On page 5, line 11, cancel "This means that" and substitute therefor "As
30 such,--.

On page 5, lines 15-16, cancel "the figure" and substitute therefor --
Figure 2--.

On page 5, line 35, cancel "can".

On page 5, line 35, insert --can-- after "also"

5 On page 5, line 36, cancel "plurality" and substitute therefor --number--.

On page 5, line 36, cancel "The figure" and substitute therefor
--Figure 2--.

On page 5, line 36, insert --this-- after "shows".

On page 5, line 37, cancel "[Lacuna]".

10 On page 5a, line 4, cancel the ",", after "Se" and substitute therefor a --.--.

On page 5a, line 4, cancel "which means that" and substitute therefor --As
such--.

On page 6, line 11, cancel "This" and substitute therefor --Thus, this--.

On page 6, line 11, cancel "thus".

15 On page 6, line 16, cancel "are" and substitute therefor --is--.

On page 7, line 11, cancel "are" and substitute therefor --is--.

On page 7, line 12, cancel "are" and substitute therefor --is--.

On page 7, after line 14, insert the following paragraph:

--Although the present invention has been described with reference to
20 specific embodiments, those of skill in the art will recognize that changes may be
made thereto without departing from the spirit and scope of the invention as set
forth in the hereafter appended claims.--

On page 10 (last page), cancel all lines of the text and substitute the
following therefor:

25 **--ABSTRACT OF THE DISCLOSURE**

A method for connecting exchanges via a packet-oriented communication
network wherein the exchanges are connected via a respective conversion device
to the packet-oriented communication network, in which data transmission
involves data packets subdivided into substructure elements being set up. For
30 data transmission, the conversion device associated with a transmitting exchange
inserts the substructure elements into the data packets, and a conversion device

associated with the receiving exchange separates the substructure elements from the data packets.--

In the Claims

On page 8, cancel line 1 and substitute the following left-hand justified heading therefor:

--We Claim as Our Invention--

Please cancel claims 1-6, without prejudice, and substitute the following claims therefor:

7. A method for connecting exchanges via a packet-oriented communication network, wherein data transmission involves data packets subdivided into substructure elements, and the connecting exchanges are connected to the packet-oriented communication network via a respective conversion device, the method comprising the steps of:

transmitting, via a transmitting one of the connecting exchanges, data to be transmitted as substructure elements to an associated transmitting conversion device;

inserting, via the transmitting conversion device, the substructure elements into data packets unchanged;

extracting, via a receiving conversion device associated with a receiving one of the connecting exchanges, the substructure elements from the received data packets; and

forwarding, via the receiving conversion device, the extracted substructure elements to the receiving one of the connecting exchanges unchanged.

8. A method for connecting exchanges via a packet-oriented communication network as claimed in claim 7, wherein the data packets are structured as Internet Protocol data packets.

9. A method for connecting exchanges via a packet-oriented communication network as claimed in claim 7, the method further comprising the steps of:

storing, via a respective cell header of a substructure element, a channel
5 identifier for denoting assignment of the substructure elements to a transmission destination; and

storing, via the respective cell header, an item of length information for indicating a number of useful data segments transmitted in the substructure element.

10

10. A method for connecting exchanges via a packet-oriented communication network as claimed in claim 7, wherein the substructure elements are structured on the basis of an Asynchronous Transfer Mode data format in accordance with an agreement known as second ATM adaptation layer AAL

15 Type 2.

11. A method for connecting exchanges via a packet-oriented communication network as claimed in claim 7, wherein for data transmission, the substructure elements are arranged in a useful data area of a data packet such that
20 a substructure element starts in a segment defined as first useful data segment of the data packet.

12. A method for connecting exchanges via a packet-oriented communication network as claimed in claim 8, the method further comprising the
25 step of:

defining a pointer, in a segment defined as first useful data segment of an Internet Protocol data packet, which is used to denote a start address of a first substructure element situated in a useful data area of the Internet Protocol data packet.

REMARKS

The present amendment makes editorial changes and corrects typographical errors in the specification in order to conform the specification to the requirements of the United States Patent practice. No new matter is added
5 thereby. Original claims 1-6 has been canceled in favor of new claims 8-12. Claims 8-12 have been presented solely because the revisions by bracketing and underlining which would have been necessary in claims 1-6 in order to present the claim in accordance with preferred United States Patent practice would have been
10 too extensive, and thus would have been too burdensome. The amendment is intended for clarification purposes only and not for substantial reasons related to patentability pursuant to 35 U.S.C. §§101, 102, 103 or 112. Indeed, the cancellation of claims 1-6 does not constitute an intent on the part of the Applicants to surrender any of the subject matter of claims 1-6.

Early consideration on the merits is respectfully requested.

15

Respectfully submitted,



(Reg. No. 39,056)

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Description

Method for connecting exchanges via a packet-oriented communication network

5

Increasing global orientation of companies means that the use of telecommunication services for transmitting voice and data is constantly increasing. The result of this is that the costs caused by these
10 telecommunication services are constantly rising and become a considerable cost factor for the companies, which therefore seek opportunities to reduce these costs. One opportunity for being able to transmit data inexpensively and on a worldwide basis is afforded by
15 global computer networks, such as the Internet.

The US patent application with the official file reference 08/942,592 has already proposed a method and an arrangement which enable data which are to be
20 transmitted within the context of a voice link to be transmitted via a packet-oriented communication network, such as the Internet. To this end, the exchanges involved in a voice link are connected to the Internet by means of a respective Internet access
25 unit - frequently called Telephony Internet Server TIS in the literature. In this case, the data which are to be transmitted within the context of a voice link are transmitted on the basis of the RTP protocol (Realtime Transport Protocol) in accordance with ITU-T Standard
30 H.225.0 (International Telecommunication Union).

If compressed voice data - as used for mobile radio, for example - are transmitted, then these compressed voice data need to be decompressed in the Internet
35 access unit, converted into the packet-oriented data format based on the RTP protocol and then compressed again for transmission at the transmitter end before transmission. Furthermore,

at the receiver end, the data need to be decompressed, converted into the original data format and then compressed again for further transmission. This frequent compression/decompression of the voice data results in corruption of the originally transmitted voice data at the receiver end, said corruption sometimes being audible and hence being perceivable as interference.

10 It is an object of the invention below to specify a method which permits voice data to be transmitted via a packet-oriented communication network without any loss of the voice quality.

15 The invention achieves the object by means of the features of patent claim 1.

A fundamental advantage of the method according to the invention is that, by subdividing the data packets set up for data transmission via the packet-oriented communication network into so-called substructure elements, data assigned to different destinations can be transmitted within one data packet.

25 Advantageous developments of the invention are specified in the dependent claims.

One advantage of refinements of the invention which are defined in the dependent claims is, amongst other things, that the transmission of an individually settable number of useful data bytes, assigned to a voice link, in a substructure element of a data packet enables data to be transmitted at a variable transmission rate. This permits the use of compression algorithms which produce a variable data stream from a continuous data stream on the basis of the redundancy which exists in the data to be transmitted without corrupting the information.

Another advantage of refinements of the invention which are defined in the dependent claims is that defining the first useful data segment of a data packet as a pointer which denotes the start address of a first
5 substructure element situated in the useful data area of the data packet provides a simple way of synchronizing the exchanges when one or more data packets are lost.

10 An illustrative embodiment of the invention is explained in more detail below with the aid of the drawing, in which:

Figure 1 shows a structogram for schematically
15 illustrating two exchanges connected via a packet-oriented communication network;

Figure 2 shows a structogram for schematically
illustrating IP data packets subdivided into
20 substructure elements, on the basis of a first conversion mode;

Figure 3 shows a structogram for schematically
illustrating IP data packets subdivided into
25 substructure elements, on the basis of a second conversion mode.

Figure 1 is a schematic illustration showing two exchanges PBX connected to an IP-oriented (Internet
30 Protocol) communication network IP-KN by means of a respective conversion unit UE. Examples of data networks in which IP protocols are preferably used are the so-called Ethernet based on IEEE Standard 802.3, or the so-called Token Ring based on IEEE Standard 802.5
35 (Institute of Electrical and Electronics Engineers). The conversion units UE are used, firstly, for connecting the exchanges PBX to the IP-oriented communication network IP-KN, and secondly, for bidirectional conversion

between the exchange-internal data format and the data format of the IP-oriented communication network IP-KN.

5 In this case, exchange-internal data transmission and switching take place on the basis of substructure elements SE having the ATM data format (Asynchronous Transfer Mode) in accordance with the so-called ATM adaptation layer AAL Type 2 (ATM Adaptation Layer). In this context, the ATM adaptation layer AAL is used for
10 adapting the ATM data format to the network layer (Layer 3) of the OSI reference model (Open System Interconnection).

15 Bidirectional conversion between the data format divided into substructure elements SE and the IP-oriented data format is performed by the conversion units UE on the basis of two different conversion modes, which are explained in more detail below.

20 Figure 2 shows a schematic illustration of IP data packets IP-P subdivided into substructure elements SE, on the basis of a first conversion mode. An IP data packet IP-P is made up of a packet header H and a useful data field having a variable length of
25 1 - 65 536 bytes. The packet header H essentially stores switching data, such as the destination address and the origin address of an IP data packet IP-P.

A substructure element SE is made up of a cell header
30 SH with a length of 3 bytes and a useful data area I of variable length (0 to 64 bytes). The cell header of a substructure element SE is in turn subdivided into a channel identifier CID (Channel Identifier) with a length of 8 bits, a length identifier LI (Length
35 Indicator) with a length of 6 bits, a transmitter/receiver identifier UUI (User-to-User Indication) with a length of 5 bits and a cell header checksum HEC (Head Erro R Control) with a length of 5

bits. The channel identifier CID provides the option to assign a substructure element SE to a

particular connection via the IP-oriented communication network IP-KN, and hence to transmit data assigned to different connections in one IP data packet.

5 On the basis of the first conversion mode, the substructure elements SE are inserted into the useful data field of an IP data packet IP-P such that the first byte of the useful data field is occupied by a cell header SH of a substructure element SE, and the
10 last byte of the useful data field concludes with the last byte of a substructure element SE. This means that the length of the useful data field of an IP data packet IP-P is chosen such that one or more substructure elements SE are transmitted completely in
15 one IP data packet IP-P. By way of example, in the figure, two substructure elements SE1, SE2 are transmitted completely in a first IP data packet IP-P, and one substructure element SE3 is transmitted in a second IP data packet IP-P.

20 In case one or more IP data packets IP-P have gone missing, e.g. as a result of a transmission error, the length identifier LI of the first substructure element SE transmitted in the useful data field of an IP data
25 packet IP-P can be used for synchronization between the transmitter and the receiver, since this length identifier LI can determine the position of other substructure elements SE which may be arranged in the useful data field.

30 Figure 3 shows a schematic illustration of IP data packets IP-P subdivided into substructure elements SE, on the basis of a second conversion mode. On the basis of the second conversion mode, substructure elements SE
35 can also be split over useful data fields of a plurality of IP data packets IP-P. The figure shows [lacuna] by way of example for the substructure element

- 5a -

SE2. The result of this is that it is no longer imperative for the useful data field of an IP data packet IP-P to start with a cell header SH of a substructure element SE, which means that, if one or more IP data packets have been lost, synchronization

of transmitter and receiver by the length identifier LI of a substructure element SE is no longer possible.

For this, the first byte of the useful data field of an
5 IP data packet IP-P is defined as a pointer Z. Thus,
the substructure elements SE are transmitted only upon
the second byte of the useful data field of an IP data
packet IP-P. This pointer Z indicates the start address
of the first substructure element SE whose cell header
10 SH is in the useful data field of an IP data packet
IP-P. This pointer Z can thus be used to restore the
synchronization between transmitter and receiver.

Within the context of data transmission from a
15 transmitting exchange PBX to a receiving exchange PBX,
the data to be transmitted are transmitted to the
conversion unit UE associated with the exchange PBX by
the transmitting exchange PBX in the form of
substructure elements SE. In the conversion unit UE,
20 the substructure elements SE are inserted into data
packets IP-P on the basis of the first or second
conversion mode, the packet header H of the data
packets IP-P containing the IP address of the
conversion unit UE associated with the receiving
25 exchange PBX. The data packets IP-P are then
transmitted via the IP-oriented communication network
IP-KN to the conversion unit UE associated with the
receiving exchange PBX. This conversion unit UE
extracts the substructure elements SE contained in the
30 received data packets IP-P and forwards the extracted
substructure elements SE to the receiving exchange PBX.

Transmission of data combined into substructure
elements SE on the basis of the ATM adaptation layer
35 AAL Type 2 via the IP-oriented communication network
IP-KN dispenses with bidirectional conversion between

usually used for transmitting voice data via the IP-oriented communication network IP-KN. In addition, the associated compression/decompression of the data by the exchanges PBX, or by the Internet access units
5 connected to the exchanges PBX, is also dispensed with. Hence, transmitting voice data from transmitter to receiver via an IP-oriented communication network IP-KN on the basis of substructure elements SE is possible without loss of the voice quality as a result of
10 repeated compression and decompression of the voice data which are to be transmitted, since the voice data are transmitted via the IP-oriented communication network IP-KN transparently, i.e. without processing, in the substructure elements SE.

Patent claims

1. A method for connecting exchanges (PBX) via a packet-oriented communication network (IP-KN),
5 in which data transmission involves data packets (IP-P) subdivided into substructure elements (SE) being set up, and the exchanges (PBX) are connected to the packet-oriented communication network (IP-KN) by means of a respective
10 conversion device (UE),
where a transmitting exchange (PBX) transmits the data to be transmitted in the form of substructure elements (SE) to its associated conversion device (UE), which inserts the substructure elements (SE)
15 into data packets (IP-P), and
where the conversion device (UE) associated with a receiving exchange (PBX) extracts the substructure elements (SE) from the received data packets (IP-P) and forwards the extracted substructure
20 elements (SE) to the receiving exchange (PBX).
2. The method as claimed in claim 1,
characterized
in that the data packets (IP-P) are structured as
25 IP data packets (Internet Protocol).
3. The method as claimed in one of the preceding claims,
characterized
30 in that the substructure elements (SE) each have a cell header (SH)
which stores a channel identifier (CID) for denoting assignment of the substructure elements (SE) to a transmission destination, and
35 which stores an item of length information (LI) for indicating the number of useful data segments

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- 8a -

transmitted in a substructure element (SE).

4. The method as claimed in one of the preceding claims,
characterized
in that the substructure elements (SE) are
5 structured on the basis of the ATM data format
(Asynchronous Transfer Mode) in accordance with an
agreement known as second ATM adaptation layer AAL
Type 2 (ATM Adaptation Layer).
- 10 5. The method as claimed in one of the preceding
claims,
characterized
in that, for data transmission, the substructure
elements (SE) are arranged in a useful data area
15 of a data packet (IP-P) such that a substructure
element (SE) starts in a segment defined as first
useful data segment of the IP data packet (IP-P).
- 20 6. The method as claimed in one of claims 1 to 4,
characterized
in that, in a segment defined as first useful data
segment of an IP data packet (IP-P), a pointer (Z)
is defined which is used to denote the start
address of the first substructure element (SE)
25 situated in the useful data area of an IP data
packet (IP-P).

Abstract

Method for connecting exchanges via a packet-oriented communication network

5

The exchanges (PBX) are connected by means of a respective conversion device (UE) to the packet-oriented communication network (IP-KN), in which data transmission involves data packets (IP-P) subdivided
10 into substructure elements (SE) being set up. For data transmission, the conversion device (UE) associated with a transmitting exchange (PBX) inserts the substructure elements (SE) into the data packets (IP-P), and a conversion device (UE) associated with the
15 receiving exchange (PBX) separates the substructure elements (SE) from the data packets (IP-P).

Figure 1

at the receiver end, the data need to be decompressed, converted into the original data format and then compressed again for further transmission. This frequent compression/decompression of the voice data results in corruption of the originally transmitted voice data at the receiver end, said corruption sometimes being audible and hence being perceivable as interference.

- 10 In addition, laid-open specification GB-A-2 320 396 discloses a method for transmitting voice data via a packet-oriented communication network in which data produced in the form of IP data packets are converted into AAL-2 data packets at the transmitter end for data transmission via the packet-oriented communication network. However, converting the IP data packets into AAL-2 data packets likewise suffers impairment of the voice quality.
- 15
- 20 It is an object of the invention below to specify a method which permits voice data to be transmitted via a packet-oriented communication network without any loss of the voice quality.
- 25 The invention achieves the object by means of the features of patent claim 1.

A fundamental advantage of the method according to the invention is that, by subdividing the data packets set up for data transmission via the packet-oriented communication network into so-called substructure elements, data assigned to different destinations can be transmitted within one data packet.

- 30
- 35 Advantageous developments of the invention are specified in the dependent claims.

One advantage of refinements of the invention which are defined in the dependent claims is, amongst other things, that the transmission of an individually
5 settable number of useful data bytes, assigned to a voice link, in a substructure element of a data packet enables data to be transmitted at a variable transmission rate. This permits the use of compression algorithms which produce a variable data stream from a
10 continuous data stream on the basis of the redundancy which exists in the data to be transmitted without corrupting the information.

Patent claims

1. A method for connecting exchanges (PBX) via a packet-oriented communication network (IP-KN),
5 in which data transmission involves data packets (IP-P) subdivided into substructure elements (SE) being set up, and the exchanges (PBX) are connected to the packet-oriented communication network (IP-KN) by means of a respective
10 conversion device (UE),
where a transmitting exchange (PBX) transmits the data to be transmitted in the form of substructure elements (SE) to its associated conversion device (UE), which inserts the substructure elements (SE)
15 into data packets (IP-P) unchanged, and
where the conversion device (UE) associated with a receiving exchange (PBX) extracts the substructure elements (SE) from the received data packets (IP-P) and forwards the extracted substructure
20 elements (SE) to the receiving exchange (PBX) unchanged.

Fig 1

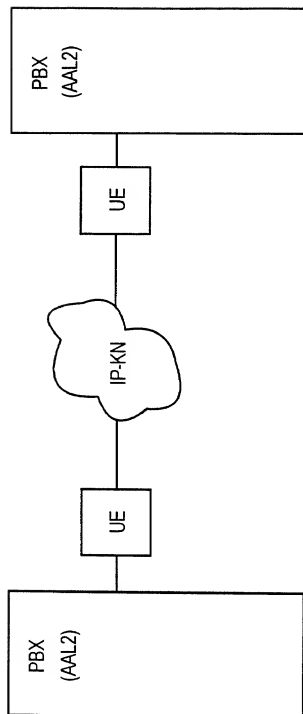


Fig 2

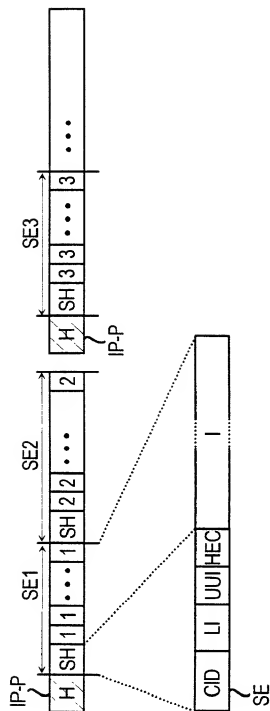
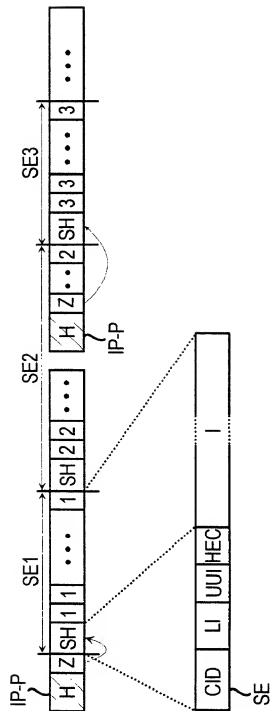


Fig 3



Declaration and Power of Attorney For Patent Application

Erklärung Für Patentanmeldungen Mit Vollmacht

German Language Declaration

Als nachstehend benannter Erfinder erkläre ich hiermit an Eides Statt:

As a below named inventor, I hereby declare that:

dass mein Wohnsitz, meine Postanschrift, und meine Staatsangehörigkeit den im Nachstehenden nach meinem Namen aufgeführten Angaben entsprechen,

My residence, post office address and citizenship are as stated below next to my name,

dass ich, nach bestem Wissen der ursprüngliche, erste und alleinige Erfinder (falls nachstehend nur ein Name angegeben ist) oder ein ursprünglicher, erster und Miterfinder (falls nachstehend mehrere Namen aufgeführt sind) des Gegenstandes bin, für den dieser Antrag gestellt wird und für den ein Patent beantragt wird für die Erfindung mit dem Titel:

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

Verfahren zum Verbinden von
Vermittlungsanlagen über ein paket-
orientiertes Kommunikationsnetz

deren Beschreibung

the specification of which

(zutreffendes ankreuzen)

(check one)

☐ hier beigefügt ist.

☐ is attached hereto.

☒ am 23. September 1999 als

☐ was filed on _____ as

PCT internationale Anmeldung

PCT international application

PCT Anmeldungsnummer PCT/DE99/03055

PCT Application No. _____

eingereicht wurde und am _____

and was amended on _____
(if applicable)

abgeändert wurde (falls tatsächlich abgeändert).

Ich bestätige hiermit, dass ich den Inhalt der obige ☐ Patentanmeldung einschliesslich der Ansprüche durchgesehen und verstanden habe, die eventuell durch einen Zusatzantrag wie oben erwähnt abgeändert wurde.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims as amended by any amendment referred to above.

Ich erkenne meine Pflicht zur Offenbarung irgendwelcher Informationen, die für die Prüfung der vorliegenden Anmeldung in Einklang mit Absatz 37, Bundesgesetzbuch, Paragraph 1.56(a) von Wichtigkeit sind, an.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

Ich beanspruche hiermit ausländische Prioritätsvorteile gemäss Abschnitt 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 119 aller unten angegebenen Auslandsanmeldungen für ein Patent oder eine Erfindersurkunde, und habe auch alle Auslandsanmeldungen für ein Patent oder eine Erfindersurkunde nachstehend gekennzeichnet, die ein Anmeldedatum haben, das vor dem Anmeldedatum der Anmeldung liegt, für die Priorität beansprucht wird.

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Declaration and Power of Attorney For Patent Application

Erklärung Für Patentanmeldungen Mit Vollmacht

German Language Declaration

Als nachstehend benannter Erfinder erkläre ich hiermit an Eides Statt:

As a below named inventor, I hereby declare that:

dass mein Wohnsitz, meine Postanschrift, und meine Staatsangehörigkeit den im Nachstehenden nach meinem Namen aufgeführten Angaben entsprechen,

My residence, post office address and citizenship are as stated below next to my name,

dass ich, nach bestem Wissen der ursprüngliche, erste und alleinige Erfinder (falls nachstehend nur ein Name angegeben ist) oder ein ursprünglicher, erster und Miterfinder (falls nachstehend mehrere Namen aufgeführt sind) des Gegenstandes bin, für den dieser Antrag gestellt wird und für den ein Patent beantragt wird für die Erfindung mit dem Titel:

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

Verfahren zum Verbinden von
Vermittlungsanlagen über ein paket-
orientiertes Kommunikationsnetz

deren Beschreibung

the specification of which

(zutreffendes ankreuzen)

(check one)

☒ hier beigefügt ist.

☐ is attached hereto.

☐ am _____ als

☐ was filed on _____ as

PCT Internationale Anmeldung

PCT international application

PCT Anmeldungsnummer _____

PCT Application No. _____

eingereicht wurde und am _____

and was amended on _____

abgeändert wurde (falls tatsächlich abgeändert).

(if applicable)

Ich bestätige hiermit, dass ich den Inhalt der obige □ Patentanmeldung einschliesslich der Ansprüche durchgesehen und verstanden habe, die eventuell durch einen Zusatzantrag wie oben erwähnt abgeändert wurde.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims as amended by any amendment referred to above.

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I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

German Language Declaration

Prior foreign applications
Priorität beansprucht

Priority Claimed

198 45 031.1 Germany

30. September 1998

(Number) (Country)
(Nummer) (Land)

(Day Month Year Filed)
(Tag Monat Jahr eingereicht)

☒ ☐
Yes No
Ja Nein

(Number) (Country)
(Nummer) (Land)

(Day Month Year Filed)
(Tag Monat Jahr eingereicht)

☐ ☐
Yes No
Ja Nein

(Number) (Country)
(Nummer) (Land)

(Day Month Year Filed)
(Tag Monat Jahr eingereicht)

☐ ☐
Yes No
Ja Nein

Ich beanspruche hiermit gemäss Absatz 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 120, den Vorzug aller unten aufgeführten Anmeldungen und falls der Gegenstand aus jedem Anspruch dieser Anmeldung nicht in einer früheren amerikanischen Patentanmeldung laut dem ersten Paragraphen des Absatzes 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 122 offenbart ist, erkenne ich gemäss Absatz 37, Bundesgesetzbuch, Paragraph 1.56(a) meine Pflicht zur Offenbarung von Informationen an, die zwischen dem Anmeldedatum der früheren Anmeldung und dem nationalen oder PCT internationalen Anmeldedatum dieser Anmeldung bekannt geworden sind.

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §122, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application.

(Application Serial No.)
(Anmeldeseriennummer)

(Filing Date)
(Anmeldedatum)

(Status)
(patentiert, anhängig,
aufgegeben)

(Status)
(patented, pending,
abandoned)

(Application Serial No.)
(Anmeldeseriennummer)

(Filing Date)
(Anmeldedatum)

(Status)
(patentiert, anhängig,
aufgeben)

(Status)
(patented, pending,
abandoned)

Ich erkläre hiermit, dass alle von mir in der vorliegenden Erklärung gemachten Angaben nach meinem besten Wissen und Gewissen der vollen Wahrheit entsprechen, und dass ich diese eidesstattliche Erklärung in Kenntnis dessen abgebe, dass wissentlich und vorsätzlich falsche Angaben gemäss Paragraph 1001, Absatz 18 der Zivilprozessordnung der Vereinigten Staaten von Amerika mit Geldstrafe belegt und/oder Gefängnis bestraft werden können, und dass derartig wissentlich und vorsätzlich falsche Angaben die Gültigkeit der vorliegenden Patentanmeldung oder eines darauf erteilten Patentes gefährden können.

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German Language Declaration

VERTRETUNGSVOLLMACHT: Als benannter Erfinder beauftrage ich hiermit den nachstehend benannten Patentanwalt (oder die nachstehend benannten Patentanwälte) und/oder Patent-Agenten mit der Verfolgung der vorliegenden Patentanmeldung sowie mit der Abwicklung aller damit verbundenen Geschäfte vor dem Patent- und Warenzeichenamt: (Name und Registrationsnummer anführen)

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (list name and registration number)

And I hereby appoint

Messrs. William E. Vaughan (Reg. No. 39,056); Robert M. Barrett (Reg. No. 30,142); Michael S. Leonard (Reg. No. 37,557); Patricia A. Kane (Reg. No. 46,446); Thomas C. Basso (Reg. No. 246,541); Robert W. Connors (Reg. No. 246,442); Troy A. Grotten (Reg. No. 46,442); Adam H. Masia (Reg. No. 35,602); Dante J. Picciano (Reg. No. 33,543); Amy J. Gast (Reg. No. 41,773); Timothy L. Harney (Reg. No. 38,174); Renato L. Smith (Reg. No. 45,117); and Alan L. Barry (Reg. No. 30,819)

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Unterschrift des Erfinders

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Second Inventor's signature

Date

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Unterschrift des Erfinders		Inventor's signature	
Datum		Date	
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Unterschrift des Erfinders		Inventor's signature	
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Unterschrift des Erfinders		Inventor's signature	
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